

IoT BASED TRAFFIC SIGNAL CONTROL SYSTEM FOR AMBULANCE

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ABSTRACT

Nowadays the road accidents in modern urban areas are increased to uncertain level. Traffic congestion and tidal flow are major facts that cause delay to ambulance. ITLS (Intelligent Traffic Light system) is introduced to bar loss of human life due to accidents. The main theme behind this scheme is to provide a smooth flow for the emergency vehicles like ambulance to reach the hospitals in time and thus minimizing the delay caused by traffic congestion. The idea behind this scheme is to implement ITLS which would control mechanically the traffic lights in the path of the ambulance. The ambulance is controlled by the control unit which furnishes adequate route to the ambulance and also controls the traffic light according to the ambulance location and thus reaching the hospital safely. This scheme is fully automated, thus it finds the accident spot, controls the traffic lights, helping to reach the hospital in time

Keyword: - ITLS, ambulance location, traffic congestion, and traffic lights.

1. INTRODUCTION

Nowadays Wireless Sensor Networks (WSN) has been applied in various domains like weather monitoring, military, home automation, health care monitoring, security and safety etc. Traffic Signal System or traffic monitoring is a vast domain where WSN can be applied to gather information about the incoming flow of traffic, traffic load on a particular road, traffic load at particular period of time (peak hours) and in vehicle prioritization. There is a significant amount of time required by the ambulance to reach the hospital due to the traffic and other unavoidable problems. That is why the ambulance faces problem which increases the chances of the deaths of victim because of time lack. Recently for detection of accident there is no any technology used. The accident sufferer is based on the leniency of others to help them to reach the hospital. To conquer the disadvantage of present system we have implemented a new system in which accident detection is done automatically. Detection of accident is being done by using a sensor, GPS, GSM unit which is fitted in the vehicle. It informs the accident location to a main server unit which contains the database of all the nearby hospitals. Information is given to the ambulance about the accident spot so that it carries the patient to the hospital. There would be a facility of controlling the traffic lights in the path of the ambulance via RF communication to render a clear path for the ambulance. This helps in reducing time required to check the patient. Currently Wireless Sensor Networks (WSN) can be used in most of the domains. Traffic Signal System or traffic monitoring is a immense domain where WSN can be applied to accumulate information about the incoming flow of traffic, traffic load on road, traffic load at specific period of time (peak hours) and in vehicle prioritization. WSN positioned along a road can be listed to rule the traffic burden on roads and at traffic crossing.

1.1 EXISTING SYSTEM

- There is loss of life due to the delay in the arrival of ambulance to the hospital in the golden hour. The ambulance in the traffic signals. It would be of great use to the ambulance if the traffic signals in the path of the hospital are ON.
- When accident occurred at the night time and near the highways that accident is unnoticed by the people due to problems due to police case.
- The cost of human life is more than any other. Due to all this problem we decided to implement a system which automatically detect accident & reduces the delay of treatment on accident victim due to distance. This system is fully automated.
- Lack of Intelligence in the detection systems

1.2 PROPOSED SYSTEM

- A new design for automatically controlling the traffic signals and achieving the above-mentioned task so that the ambulance would be able to cross all the traffic junctions without waiting.
- In proposed system if a vehicle has met accidents, immediately an alert message to Ambulance.
- For easy access the server maintains a database for each node, and hence each node will have a unique id for addressing it.
- The ambulance is guided to the hospital by the Traffic signal server send the ambulance emergency condition.
- Wireless technologies used for information transferring.

2. BLOCK DIAGRAM

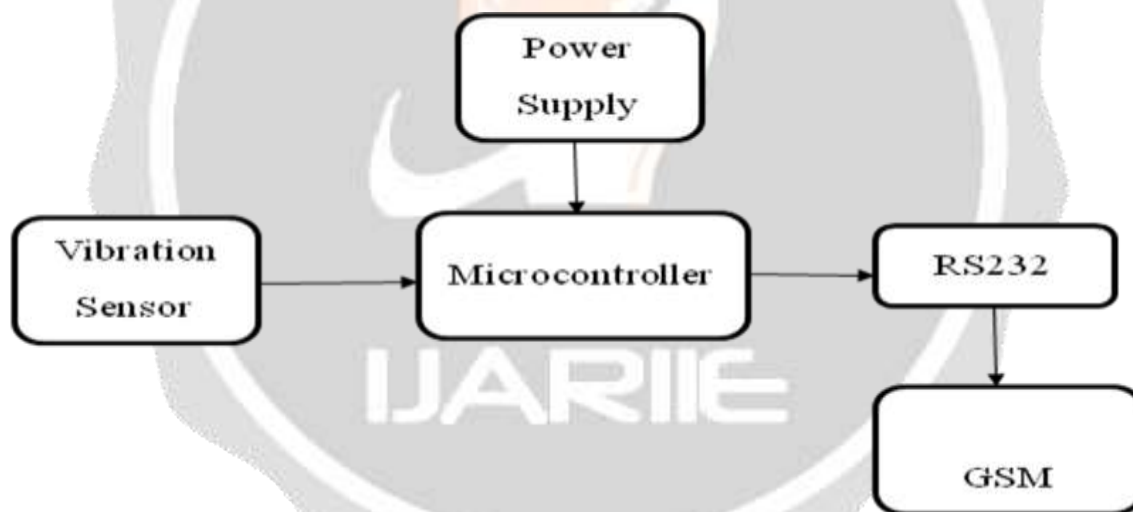


Fig -1: Vehicle Section



Fig -2: Ambulance Section

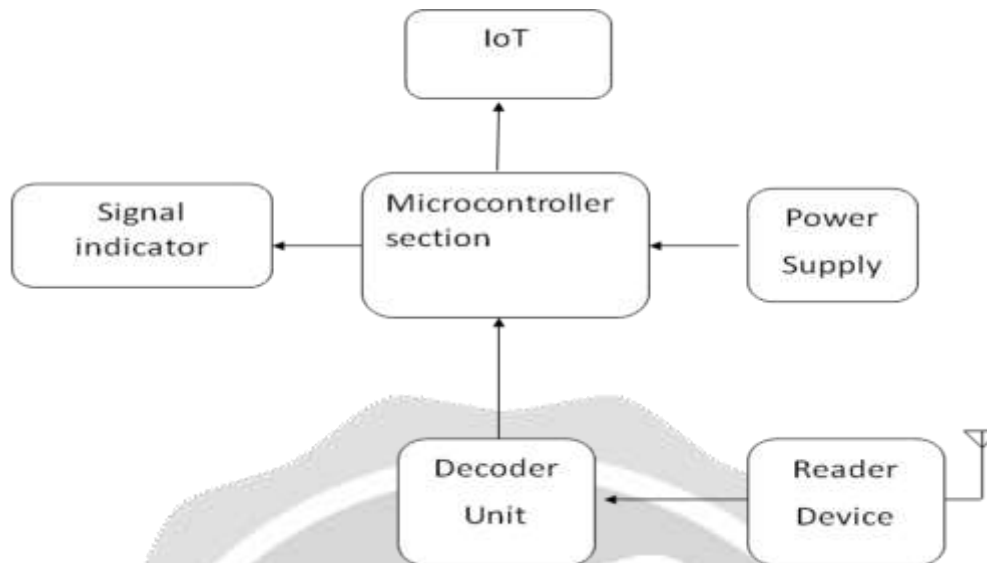


Fig -3: Signal Section

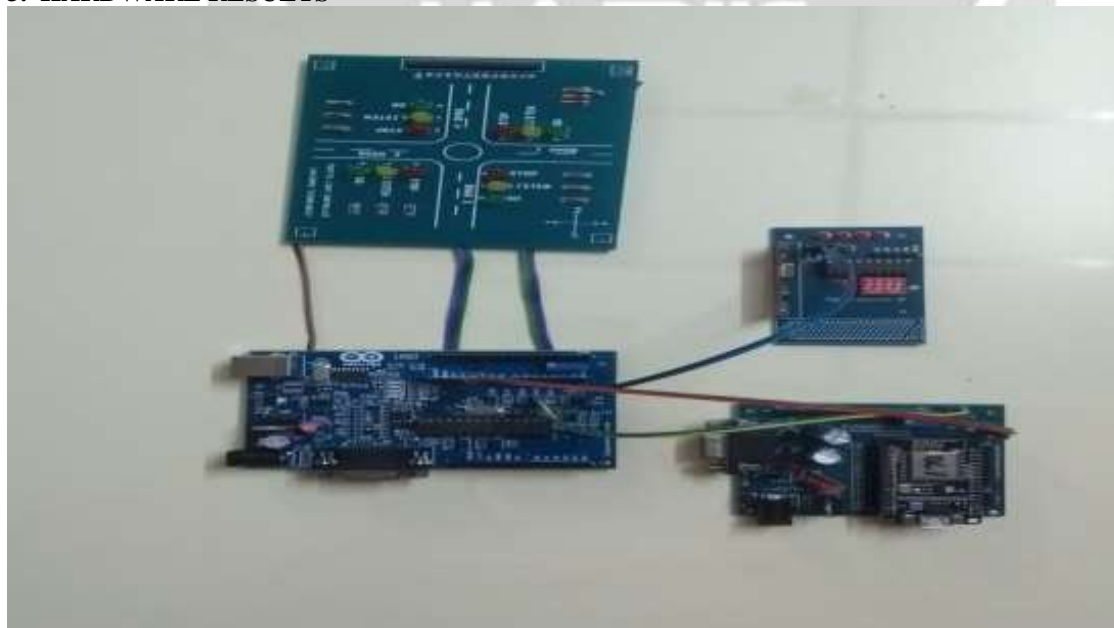
2.1 HARDWARE AND SOFTWARE REQUIRED

The developed prototype consists of a pile of hardware - Arduino, Vibration Sensor, RF Transmitter/Receiver, Internet of Things (IoT), LCD Display, Global System for Mobile Communication (GSM). Arduino Software is used to program into the Arduino controller. The programming is done with Embedded C. Embedded C is relatively easy to program and less time-consuming.

2.2 METHODOLOGY

- In vehicle we have vibration sensor to detect the Accident
- Once the vibration detected its send location to the nearby ambulance driver and hospital using GSM
- In Ambulance we RF Transmitter and in Road Signal we have a RF Receiver
- Once the ambulance reaches the range of RF Frequency it will transmit the signal to RF in Road Signal and change it into Green signal and make the opposite signal to Red.

3. HARDWARE RESULTS



3.1 SOFTWARE RESULTS

LogID	DATA	LogDate	LogTime
4	Suresh_Con_786539_94321	03/01/2020	21:22:14
14	Rajesh_Con_89756_67543	03/01/2020	21:24:21
15	Suresh_Con_786539_94321	03/01/2020	21:24:29
22	Rajesh_Con_89756_67543	03/01/2020	21:25:52
23	Suresh_Con_786539_94321	03/01/2020	21:26:00

4. CONCLUSIONS

Human life is precious and must follow safety measures very conscious in all aspects this of course includes ambulance services too. In this, by using intelligent ambulance system we can achieve the uninterrupted service of the traffic control system by implementing the alternate methods for signal change to allow flow control. The accuracy of the RFID is more than camera's so our proposed paper also improves the performance of traffic signal violation detection system. This system is cost effective and deployed using IoT, GSM, which make it more efficient.

5. REFERENCES

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